

Serial No. 10/699,909

Docket No. 200310794-1

DEC 07 2006

**REMARKS**

Claims 1-15, 18 and 20-38 are currently pending in the subject application, and are presently under consideration. Claims 1-9, 11-15, 18, 20-22 and 24-37 are rejected. Claims 10 and 23 have been indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 1, 15, 25, 30, 32 and 34 have been amended. New claim 38 has been added. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

**I. Rejection of Claims 1-2, 5-6, 9, 11, 14, 25-32 and 34-35 under 35 U.S.C. 103(a)**

Claims 1-2, 5-6, 9, 11, 14, 25-32 and 34-35 have been rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Application No. 2002/0168043 to Sander ("Sander"), in view of U.S. Patent No. 6,269,135 to Sander ("Sander 2"). Applicant's representative traverses this rejection for the following reasons.

As stated above, claim 1 has been amended. The amendments to claim 1 are supported by the Specification (See Spec. Page 3, Lines 14-21). Sander taken in view of Sander 2 does not make amended claim 1 obvious. Sander taken in view of Sander 2 fails to teach or suggest the sample network or the detector recited in amended claim 1. The sample network recited in claim 1 provides plural samples of an input signal corresponding to the input signal delayed by a known amount of time. In contrast, in Sander, the output of flip flops Q3-Q6 illustrated in FIG. 5 are delayed versions of a derived clock signal (See Sander, Para. [0029]). Sander also discloses that the delayed versions are delayed relative to one another by one period of an unknown clock signal (See Sander, Para. [0029]). Clearly, since the period of the unknown clock signals is unknown, the amount of delay (i.e. an amount of time) would be unknown as well. In fact, Sander taken in view of Sander 2 fails to teach or suggest any structure or process that corresponds to the sample network recited in amended claim 1.

Moreover, the detector recited in amended claim 1 determines the frequency of an input signal based on (i) samples of an input signal for different time instances of the input signal residing within less than or equal to one period of the input signal, and (ii) the known amount of time for each of the plural samples. As stated above, Sander taken in view of Sander 2 fails to teach or suggest that plural samples of an input signal correspond to the input signal delayed by a known amount of time, as recited in amended claim 1. Therefore, Sander taken in view of Sander 2 cannot teach determining the frequency of the input signal

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based on the known amount of time for each of the plural samples, as recited in amended claim 1. Consequently, the combined teachings also fail to teach or suggest such a detector to provide a value that represents the determined frequency of the input signal, as recited in claim 1. For the reasons stated above, one of ordinary skill in the art would not create a system based on the combined teachings of Sander and Sander 2 that includes the structural and functional interrelationships of a sample network and the detector recited in amended claim 1. Therefore, amended claim 1 is patentable.

Claims 2, 5-6, 9 and 11 depend either directly or indirectly from amended claim 1, and are not obvious for at least the same reasons as stated above with respect to amended claim 1, and for the specific elements recited therein. Accordingly, claims 2, 5-6, 9 and 11 are patentable over the cited art.

As stated above, claim 25 has been amended. The amendments to claim 25 are supported by the Specification (See Spec. Page 3, Lines 14-21). Sander taken in view of Sander 2 does not make amended claim 25 obvious. For the reasons stated above with respect to amended claim 1, Sander taken in view of Sander 2 fails to teach or suggest means for sampling an input signal having an unknown frequency and for providing plural indications of signal state associated with different time instances of the input signal delayed for different known amounts of time, as recited in amended claim 25. As stated above, in Sander, the amount of delay (of a derived clock signal) is unknown, since the amount of delay is based on the period of an unknown signal. Moreover, since Sander taken in view of Sander 2 fails to teach or suggest the means for sampling recited in amended claim 25, Sander taken in view of Sander 2 cannot teach or suggest means for determining a frequency of an input signal based on the known amounts of time, as recited in amended claim 25. Thus, Sander taken in view of Sander 2 does not make amended claim 25 obvious, and amended claim 25 is patentable.

Claims 26-29 depend from amended claim 25 and are not obvious for at least the same reasons as amended claim 25 and for the specific elements recited therein. Accordingly, claims 26-29 are patentable over the cited art.

Additionally, regarding claim 29, the Advisory Action dated November 3, 2006 ("Advisory Action"), contends that in Sander, the "Out" signal (illustrated in FIG. 5) is produced by controlling the frequency of an input signal based on a comparison of the frequency of the input signal and a desired frequency, and therefore, Sander teaches means for controlling a frequency, as recited in claim 29. Applicant's representative respectfully

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disagrees. Claim 29 recites means for controlling the frequency of an input signal based on a comparison of a frequency of an input signal and a desired frequency. Claim 29 also recites that the comparison is performed by means for comparing the frequency value relative to a desired frequency value. Sander teaches a digital circuit that provides a number stream for frequency and/or phase comparison of digital or digitized signals (See Sander, Abstract). Nothing in Sander teaches or suggests that the frequency of either of the digital signals (F<sub>x</sub> and F<sub>s</sub>) is adjusted based on the Out signal. Therefore, Sander taken in view of Sander 2 does not make claim 29 obvious.

As stated above, claim 30 has been amended. The amendments to claim 30 are supported by the Specification (See Spec., Page 3, Lines 14-21). Sander taken in view of Sander 2 does not make amended claim 30 obvious. First, for the reasons stated above with respect to amended claims 1 and 25, Sander taken in view of Sander 2 does not teach or suggest sampling a signal at predetermined and spaced apart time intervals to provide a plurality of output samples indicative of the signal state for different time instances of the signal. Secondly, the combination of Sander and Sander 2 also fails to teach or suggest that a frequency value for a signal is determined based the predetermined spaced apart time intervals and based on the output samples that correspond to time instances of the signal residing within a single period of the signal, as recited in amended claim 30. Instead, for the reasons stated above with respect to amended claims 1 and 25, neither Sander nor Sander 2 teaches or suggests sampling a signal at predetermined and spaced apart time intervals such that there is be no basis to enable a frequency value for the signal to be determined in the manner recited in amended claim 30. Accordingly, Sander taken in view of Sander 2 does not make amended claim 30 obvious, and amended claim 30 is patentable over the cited art.

Claims 31-32 and 34-35 depend either directly or indirectly from amended claim 30 and are not obvious for at least the same reasons as amended claim 30 and for the specific elements recited therein. Accordingly, claim 31-32 and 34-35 are patentable over the cited art.

For the reasons stated above, claims 1-2, 5-6, 9, 11, 14, 25-32 and 34-35 are patentable over the cited art. Accordingly, withdrawal of this rejection is respectfully requested.

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**II. Rejection of Claims 3-4, 7-8, 12, 15, 18, 20-22, 24 and 33 under 35 U.S.C. 103(a)**

Claims 3-4, 7-8, 12, 15, 18, 20-22, 24 and 33 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Sander, in view of Sander 2 and in further in view of US Patent No. 6,326,826 to Lee, et al. ("Lee"). Applicant's representative traverses this rejection for the following reasons.

Claims 3-4, 7-8 and 12 depend either directly or indirectly from claim 1. The further addition of Lee does not make up for the aforementioned deficiencies of Sander taken in view of Sander 2 with respect to claim 1, from which claims 3-4, 7-8 and 12 depend.

Additionally, regarding claim 12, Sander taken in view of Sander 2 and in further view of Lee does not teach or suggest claim 12. In the rejection of claim 12, the Final Rejection contends that the number stream provided by Sander corresponds to the comparator signal recited in claim 12 (See Final Rejection, Page 9). Applicant's representative respectfully disagrees. In claim 12, a comparator provides the comparator signal based on a comparison of a value of a frequency for an input signal and a value of a desired frequency. Sander discloses that decision logic block 411 receives an alias value and a Sum value 410 and provides either a logic 1 or logic 0 (the number stream) (See Sander, Para. [0027]). As discussed above with respect to claim 1, no part of the Sum value 410 is based on a known amount of time for each of a plurality samples of an input signal, like the value of frequency recited in claim 1, from which claim 12 depends. Thusly, the number stream disclosed in Sander cannot correspond to the comparator signal recited in claim 12 since the recited comparator signal is based on a value of a frequency, which value, as recited in claim 12, is not taught or suggested by the cited art.

Moreover, Applicant's representative respectfully submits that there is no motivation to combine and modify the teachings of Sander, Sander 2 and Lee to read on claim 12, as suggested by the Final Rejection. The United States Court of Appeals for the Federal Circuit ("Federal Circuit") has held that obviousness cannot be established by combining teachings of multiple references to produce the claimed invention, absent some teaching or suggestion supporting the combination. *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1574, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). In Lee, the output of frequency detection logic 12 drives charge pump 14 (See Lee, FIG. 1). Additionally, Lee discloses that detection logic 12 receives an input reference clock (REF\_CK) and a seven-phase clock (CK[1:7]). In contrast, the decision logic 411 taught in Sander receives the Sum value 410 and the alias value. Sander does not teach or suggest that decision logic 411 receives a clock signal.

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Accordingly, nothing in Sander or Lee teaches or suggests that decision logic 411 of Sander could be used in place of the frequency detection logic 12 of Lee. Furthermore, it is respectfully submitted that one skill in the art would not open the closed delay-locked loop (DLL) system disclosed in Lee, which appears would be necessary if decision logic 411 of Sander were to replace frequency detection logic 12 of Lee. Therefore, it is respectfully submitted that in rejecting claim 12, the Final Rejection is impermissibly using claim 12 and/or the present application to provide the motivation to combine and modify the teachings of Sander, Sander 2 and Lee to read on claim 12.

Moreover, Applicant's representative respectfully submits, that in rejecting claim 12, the Final Rejection has not stated with any specificity as to how the teachings of Sander, Sander 2 and Lee could be combined to create the system of claim 12. Instead, the Final Rejection broadly states that that one skilled in the art would be motivated to use the DLL of Lee with the combination system of Sander and Sander 2 (See Final Rejection, Page 10). The DLL disclosed in Lee has only one input signal (REF\_CK). Therefore, Applicant's representative assumes that the Final Rejection is suggesting that that Sander, Sander 2 and Lee could be combined such that the output of decision logic 411 ("Out") disclosed in Sander could be employed to drive the DLL disclosed in Lee (See Final Rejection, Pages 9-10). Applicant's representative respectfully disagrees.

The Federal Circuit has held that references teach away from their combination if the references taken in combination would produce a seemingly inoperable device. *McGinley v. Franklin Sports Inc.*, 262 F.3d 1339, 1354 60 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 2001). The Out signal taught in Sander could not be used to drive (e.g., via the REF\_CK signal) the DLL illustrated in FIG. 1 of Lee. The Out signal disclosed in Sander is a digital signal (e.g., a logic 1 or logic 0), and nothing in Sander teaches or suggests that the Out signal has a frequency. In sharp contrast, the REF\_CK signal disclosed Lee is an analog clock signal with a specific frequency (See Lee, FIG. 3). If the Out signal with no frequency of Sander were employed as the REF\_CK signal of Lee, the DLL disclosed in Lee would not be able to adjust the frequency of the multiphase clock CK[1:7], as the timing of CK[1:7] is dependent on the frequency of REF\_CK, and REF\_CK would have no such frequency (See, for example, FIG. 3 of Lee). Accordingly, Sander, Sander 2 and Lee teach away from their combination in the manner suggested by the Final Rejection in the rejection of claim 12.

Moreover, the Advisory Action states that Lee discloses a comparator that provides a comparator signal based on a comparison between a desired REF\_CK and an input clock

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signal CK. Applicant's representative respectfully disagrees with the Advisory Action's interpretation of Lee. As illustrated in FIG. 1 of Lee, the CK signals are generated by the delay chain 11 based on of the REF\_CK signal. Therefore, the CK signals are not input clock signals, as the Advisory Action contends. Further, the Advisory Action contends that one of ordinary skill would be motivated to incorporate the teachings of Lee into Sander taken in view of Sander 2 to lock a clock with improved locking. However, Applicant's representative respectfully submits that nothing in the Final Rejection or the Advisory Action explains what signal from the system disclosed in Sander would be provided to the system disclosed in Lee as the REF\_CK. The Board of Patent Appeals and Interferences had held that obviousness cannot be established when the Examiner has not specifically explained how one of ordinary skill in the art would have found it obvious to practice any specific invention within the scope of the claims. *Ex parte Humphreys*, 24 U.S.P.Q.2d (BNA) 1255, 1262 (B.P.A.I., 1992). Accordingly, the rejection of claim 12 should be withdrawn.

Regarding claim 15, as stated above, claim 15 has been amended. Sander taken in view of Sander 2 and in further view of Lee does not make amended claim 15 obvious. The detector recited in amended claim 15 provides a frequency value of an input signal based a known amount of time for each of a plurality of delay elements and based on output samples that correspond to different time instances of the input signal. In contrast, as discussed above, the Sum value 410 disclosed in Sander is not based on a known amount of time for each of a plurality of delay elements. Therefore, Sander, Sander 2 and Lee taken individually or in combination do not teach or suggest the detector recited in amended claim 15. Accordingly, Sander, Sander 2 and Lee do not make amended claim 15 obvious, and amended claim 15 is patentable.

Claims 18, 20-22 and 24 depend from amended claim 15 and are not obvious for at least the same reasons as stated above with respect to amended claim 15, and for the specific elements recited therein. Accordingly, claims 18, 20-22 and 24 are patentable.

Claim 33 depends from claim 30. The further addition of Lee does not make up for the aforementioned deficiencies of Sander taken in view of Sander 2, with respect to claim 30, from which claim 33 depends. Accordingly, claim 33 is patentable over the cited art.

For the reasons stated above, claims 3-4, 7-8, 12, 15, 18, 20-22, 24 and 33 are patentable over the cited art. Accordingly, withdrawal of this rejection is respectfully requested.

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**III. New Claim 38**

New claim 38 has been added by this amendment. New claim 38 depends from amended claim 15 and specifies that the frequency value is expressed in units of an inverse of a period of an input signal (e.g. Hertz). New claim 38 further distinguishes between the frequency value recited in claim 15 and the ratio between  $F_x$  and  $F_s$  disclosed in Sander. In the Advisory Action, the examiner contends that the ratio of frequencies between  $F_x$  and  $F_s$  represents a normalized frequency (See Advisory Action, citing [http://en.wikipedia.org/wiki/Normalized\\_frequency](http://en.wikipedia.org/wiki/Normalized_frequency)). However, the cited Wikipedia article states that a normalized frequency is a dimensionless quantity, obtained by taking the ratio between an actual frequency and a reference value (Emphasis added, See [http://en.wikipedia.org/wiki/Normalized\\_frequency](http://en.wikipedia.org/wiki/Normalized_frequency)). A dimensionless quantity does not correspond to the frequency value recited in new claim 38, which is expressed units of an inverse of a period of an input signal. Accordingly, new claim 38 is patentable.

**III. Allowable Subject Matter**

Applicant appreciates the indication that claims 10 and 23 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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IV. CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

Respectfully submitted,

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